



**Signal Processing and Speech  
Communication Laboratory**

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**PhD Research and Teaching Position in Machine Learning**

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**Background**

While machine learning is traditionally a resource intensive task, embedded systems and the vision of the Internet-of-Things fuel the interest in resource efficient approaches. These approaches require a carefully chosen trade-off between performance and resource consumption in terms of computation and energy. On top of this, it is crucial to treat uncertainty in a consistent manner in all but the simplest applications of machine learning systems. In particular, a desideratum for any real-world system is to be robust in the presence of outliers and corrupted data, as well as being “aware” of its limits, i.e. the system should maintain and provide an uncertainty estimate over its own predictions. These complex demands are among the major challenges in current machine learning research and key to ensure a smooth transition of machine learning technology into every day's applications. The growing interest in deploying neural networks (NNs) on embedded devices has led to plenty of research investigating NNs with low precision weights. While most methods involve a quantization step, we are interested in a Bayesian approach where we first infer a distribution over a discrete weight space from which we subsequently derive hardware-friendly low precision NNs. In this research project, novel approaches for resource-efficient neural networks should be developed.

**Required skills**

- M.Sc. degree in relevant field (Computer Science, Telematics (ICE), Electrical Engineering)
- Background in machine learning, pattern recognition, signal processing, programming (Matlab, Python, C)
- Interest in teaching practical courses in machine learning and signal processing
- Independent and self-motivated working
- Excellent communication skills, fluency in English and German

**How to apply?**

Please send your application (CV, motivation letter, list of grades) to [dekanat.etit@tugraz.at](mailto:dekanat.etit@tugraz.at) under the number 4420/19/27 until 30.11.2019. The position is filled as soon as a suitable candidate is found.